

Winter Warmth—grade 2

Introduction:

Animals have special adaptations to help them survive the cold northern winters. Some adaptations are behavioral (hibernation) and others are physical. Some animals have warm fur, others grow a thick coat of wool, some have a layer of fat and birds have special types of feathers. This activity will explore various types of insulation that animals use to keep warm.

Objective:

Students will be able to:

1. name different types of animal insulation and describe how they keep animals warm in winter.
2. make conclusions about the most effective type of insulation based on an experiment using animal fur, feathers and lard.

Materials:

Animal pelts
Bags of feathers
Bags of Lard or Crisco
Bags of wool
Animal furs
Plastic water bottles filled with hot water
Thermometers
Data sheets
Pictures of animals
Clipboards
Pencils
Snowshoes

Activity

Introduction (10 min)

Begin in the classroom by asking students how animals keep warm in winter. Compare this to how they themselves keep warm and point out how easy it is for us to get an extra blanket or a warm jacket. Animals do not have these luxuries. So how do they survive?

Discuss briefly the different types of insulation that animals have. Have students provide examples of animals that grow fur, wool and blubber. Explain how birds have a special layer of downy feathers that they can fluff up to trap warm air near their body. These are the same feathers we use to make down blankets, jackets and pillows! Show them the color photos to illustrate what you discuss with them.

Ask students if they think all of these materials are equally warm. Do birds have just as easy a time staying warm as a bear or how about a seal in the frigid arctic waters? Explain that they will be scientists and investigate the effectiveness of various types of animal insulation. Have them share ideas of how you could do this and lead them to the experiment design they will do today. Have students make a hypothesis about which insulation will work the best. Ask them how they will

know which insulation works best. (The temperature will have changed the least—there will probably be some confusion around this be sure to revisit at the end of experiment)

Experiment (15 min):

Students work in groups.

1. Distribute a different type of insulation (either a bag of feathers, a bag of lard, bag of wool or an animal pelt) to each group.
2. They will also get a hot water bottle and a thermometer. Have them all practice reading the thermometer and explain that it works the same way as a ruler. Does it go up by one's or two's? Teachers/parent volunteers can assemble the water bottles/thermometers, if available. Have them fill the bottles with hot tap water.
3. Each group will have one data recorder. This student gets a clipboard, pencil and data sheet.
4. Water bottles get inserted into the bags of insulation. Have students take initial readings of the temperature and record on the data sheet.
5. Place water bottles in a snowbank outside making sure thermometers are sticking up. Take a second reading after getting on snowshoes or after 5 minutes (don't focus so much on meticulous timing with this age). Ask them if this temperature should be warmer, cooler or about the same as before. Will probably be about the same or slightly cooler—if they record a higher number they probably didn't read the thermometer correctly.

Wildlife Signs Snowshoe Hike (15-20 min)

6. Go for a snowshoe hike and look for evidence of animals (tracks, nests, droppings, burrowing holes in snow, birds).

Experiment Results (15 min)

7. Return to water bottles and record the temperature one last time.
8. In the classroom, walk them through making a graph. Ask teacher if each student or each group should make a graph.
9. Discuss: Which insulation worked best? How do you know? Because the temperature changed the least. To further explain this concept describe to them two kids going outside to play in the winter. One wears a thick jacket and one wears a thin little windbreaker. They both are warm right when they get outside but who will get colder first? The windbreaker-his temperature changed the most: it got colder than the friend with the thick jacket. This is the same thing that happened with the water bottles.
10. Ask them how they might repeat the experiment to get better results (being more careful with reading thermometer, making sure water bottle is completely covered, etc.)

Animal Insulation Experiment

Wildlife Biologists: _____

Date: _____ Temperature: _____

Hypothesis: We predict that _____ will be the best insulator because:

Insulation type:
feathers
wool

Time	Temperature
Time 1:	
Time 2:	
Time 3:	

fur
fat

Temperature °C

